

**BY ORDER OF THE COMMANDER
OGDEN AIR LOGISTICS COMPLEX**

**OGDEN AIR LOGISTICS COMPLEX
INSTRUCTION 21-113**



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Maintenance

NONDESTRUCTIVE INSPECTION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction establishes the minimum requirements for the qualification and certification of both organic and contractor nondestructive inspection (NDI) personnel in the Ogden Air Logistics Complex (OO-ALC); to include operations at 309th Aerospace Maintenance and Regeneration Group, located at Davis Monthan Air Force Base (AFB), 309th Electronics Maintenance Group, located at Kadena Air Base, 571st Aircraft Maintenance Squadron, located at Randolph AFB, 581st Missile Maintenance Squadron, and all other satellite sites conducting NDI related activities also managed by the OO-ALC. This instruction meets or exceeds the requirements of National Aerospace Standard (NAS), Revision 3, *Certification and Qualification of Nondestructive Test Personnel*. This instruction applies to personnel using NDI methods to accept materials, products, subsystems, components or systems. It also applies to individuals responsible for the technical adequacy of NDI procedures, and those providing technical training for NDI personnel. This publication supplements Air Force Instruction (AFI) 20-114, *Air and Space Equipment Structural Management*; Air Force Materiel Command Instruction (AFMCI) 21-101, *Depot Maintenance Activation Planning*, Chapter 19, *Depot Maintenance Technical Data and Work Control Documents*; AFI 21-101, Air Force Materiel Command Supplement (AFMCSUP), *Aircraft and Equipment Maintenance Management*, Paragraph 14.54-14.55, *Maintenance Training and Production Acceptance Certification (PAC) Programs*; AFI21-101_AFMCSUP_309MXW Guidance Memorandum (GM) 21-04, *Aircraft and Equipment Maintenance Management*, Paragraph 14.70; Technical Order (T.O.) 33B-1-1, *Nondestructive Inspection Methods, Basic Theory*; and T.O. 33B-1-2 *Nondestructive Inspection General Procedures and Process Controls*. Ensure that all records created as a result of processes

prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force (AF) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rimc.cfm>. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force Information Management Tool (AF IMT) 847, *Recommendation for Change of Publication*; route AF IMTs 847 from the field through the appropriate functional chain of command.

1. General Information. This instruction establishes guidance and procedures for NDI. This is a new publication established to meet requirements and must be read in its entirety.

1.1. NDI Methods. This instruction relates to the following methods of NDI:

- 1.1.1. Liquid Penetrant (PT);
- 1.1.2. Magnetic Particle (MT);
- 1.1.3. Eddy Current (ET);
- 1.1.4. Ultrasonic (UT);
- 1.1.5. Radiography (RT);
- 1.1.6. Shearography (ST);
- 1.1.7. Thermography (IRT).

1.2. Other NDI Techniques. Other types of NDI performed at OO-ALC are considered techniques within the methods listed above. Personnel performing computed tomography, computed RT, and real-time RT will be certified in RT. OO-ALC personnel utilizing specialized equipment to perform C-scan UTs will be certified in UT. It will be the responsibility of the supervisor to ensure that personnel have been trained and are proficient in the use of special equipment IAW the PAC program.

1.2.1. OO-ALC NDI Techniques within NDI Methods:

- 1.2.1.1. RT. Film RT, computed tomography, computed RT, and real time RT;
- 1.2.1.2. UT. A-Scan, C-Scan and Phased Array;
- 1.2.1.3. PT. Type I fluorescent (portable and stationary);
- 1.2.1.4. MT. Fluorescent wet (portable and stationary);
- 1.2.1.5. ET. Surface, bolt hole automated, automated wheel scanner, conductivity;
- 1.2.1.6. IRT. Indirect thermal;
- 1.2.1.7. ST. Vacuum stressing, thermal stressing, mecad stressing.

1.3. New Methods. New workloads may require new methods of NDI to be performed at OO-ALC. New methods may be considered techniques within an existing method as stated above, or as standalone methods. The OO-ALC NDI Program Manager (PM) will determine the requirements for personnel training, experience, and examinations for any new NDI methods. Initial certification requirements for individuals performing new methods will be determined by the OO-ALC NDI PM (see paragraph 4.1.).

1.4. Technique Forms/Process Orders. Applicable to each NDI element and approved by the assigned cognizant level 3.

2. NDI Levels.

2.1. Levels of Qualification. Levels of qualification established by this instruction are:

2.1.1. Trainee.

2.1.2. Level 1

2.1.3. Level 2

2.1.4. Level 3

2.2. Instructor.

2.3. Auditor.

2.4. Levels of Certification. Levels requiring certification IAW this instruction are:

2.4.1. Level 1

2.4.2. Level 2

2.4.3. Level 3

3. NDI Requirements.

3.1. Cognizant NDI Organization. The 809th Maintenance Support Squadron (809 MXSS), NDI Program Management Office (809 MXSS/MXDEA) shall be the cognizant NDI organization in support of the OO-ALC. 809 MXSS/MXDEA shall be responsible to maintain this instruction, and shall be responsible for the training, certification, and qualification of all personnel. 809 MXSS Materiel Engineering Flight (809 MXSS/MXDEA) Level 3 personnel shall develop or approve new NDI procedures, provide general training, provide training on specific procedures, and administer the NDI certification program. The OO-ALC NDI PM (assigned to the 809 MXSS/MXDEA), as defined in AFI 21-105 paragraphs 3.3.3.1, shall be the responsible Level 3 for the OO-ALC. The OO-ALC NDI PM Level 3 individual should be appointed in writing by the OO-ALC Commander/Director. All 809 MXSS/MXDEA Level 3 personnel shall be designated special skills qualification (SSQ) officials as required in AFI 21-101_AFMCSUP, paragraph 14.54.2. in the applicable Level 3 certified NDI method.

4. Detailed Certification Procedure.

4.1. Levels of Qualifications.

4.1.1. Trainee. A trainee is an individual who is participating in training for an NDI method and is not certified. Trainees shall obtain work experience only under the direct supervision of a Level 2, Level 3, or certified instructor in the same method. Trainees shall not independently conduct tests, make, accept or reject decisions, or perform any other NDI functions.

4.1.2. Level 1. Level 1 is the first certifiable qualification level. The Level 1 individual shall have the skills and knowledge to perform specific tasks and specific calibrations. A Level 1 individual may perform actual inspections for acceptance or rejection of production parts only under the direction of a certified Level 2 or Level 3 individual, or

be task certified for a specific task. The Level 1 individual shall be knowledgeable of any necessary preparation of parts before, or after inspection. The individual shall be able to follow procedures in the techniques for which they are certified.

4.1.3. Level 2. Level 2 individuals shall have the skills and knowledge to set up and calibrate equipment, conduct tests and to interpret, evaluate and document results IAW procedures approved by 809 MXSS/MXDEA NDI Level 3 personnel. The individual shall be thoroughly familiar with the scope and limitations of the method in which they are certified, and shall be capable of directing the work of trainees and Level 1 personnel, along with conducting on-the-job training (OJT) for lesser trained inspectors. The individual shall be able to organize and document NDI results. The individual shall be familiar with standards, T.O.s, Time Compliance Technical Orders, etc., that pertain to the method of inspection and product being evaluated. NDI Level 2 personnel shall write procedures when required, which must be approved by the 809 MXSS/MXDEA NDI Level 3 personnel prior to use.

4.1.4. Level 3. Level 3 individuals shall have the skills and knowledge to interpret codes, standards, and other contractual documents that control the methods and products utilized at OO-ALC. Level 3 personnel shall select the method and technique for a specific inspection, and prepare and/or verify the adequacy of procedures. Only 809 MXSS/MXDEA individuals certified to NDI Level 3 shall have the authority to approve procedures for technical adequacy in the method to which they are certified. The individual shall have a general knowledge of all other NDI methods utilized at OO-ALC. The individual shall be capable of directing the training and examination of personnel in the method certified. The individual must pass an appropriate Level 2 practical examination to conduct NDI for the acceptance of parts.

4.1.5. Instructor. Instructors shall have the skills and knowledge to plan, organize and present classroom, laboratory or OJT programs of instruction IAW approved course outlines. OO-ALC NDI PM shall be responsible for providing instructors and performing classroom training. **Note:** Reference paragraph 4.6. for qualification requirements.

4.1.6. Auditor. Auditors shall have the education, training skills, and knowledge to understand the processes and procedures utilized in the application of NDI. The individual shall be familiar with the applicable codes, standards, and other contractual documents that control the method. **Note:** Reference paragraph 4.7. for qualification requirements.

4.2. Training. Candidates for certification as Level 1 or Level 2 shall complete sufficient organized classroom training to become proficient with the principles and practices of the applicable test methods and techniques. Formal training requirements for Level 1 and Level 2 personnel may be accomplished by structured/traditional OJT, as long as sufficient time has been spent on classroom training, and the OJT is documented on AF IMT 797, *Job Qualification Standard Continuation/Command JQS*. This applies to all NDI methods. This will be at the discretion of the OO-ALC NDI PM, or the 809 MXSS/MXDEA Level 3 responsible for meeting these requirements. The training will be conducted IAW a detailed course outline approved by the OO-ALC NDI PM IAW NAS 410 Revision 3. Classroom

training is provided by 809 MXSS/MXDEA. Any NDI method certification requires prior completion of the “Introduction to Metals Course”.

4.2.1. Minimum Required Classroom Training Hours. Training will encompass Level 1 and Level 2 combined for all candidates seeking certification. The minimum training hours for this type of training is given in **Table 1.** for the specified NDI methods. There are no additional training requirements to transition from Level 2 to Level 3, nor can an individual have sufficient training to allow certification to Level 3, without prior certification as a Level 2.

Table 1. Minimum Formal Training Hours, Level 1 and Level 2

Method	Level 1	Level 2 (with Level 1 experience)	Level 2 Direct Access (without Level 1 experience)
Penetrant	16	16	32
MT	16	16	32
IRT	40	40	80
ET	40	40	80
UT	40	40	80
RT	40	20	60
ST	40	20	60

4.2.2. Previous/Equivalent Training. Personnel who have received previous training or have been trained IAW other NDI qualification/certification programs must have the training documented. The previous training must be approved by the OO-ALC NDI PM. For personnel credited with training, or those not certified within 6 months of their training, refresher training must be provided. The depth of coverage shall be determined by the OO-ALC NDI PM.

4.2.3. Military Training. Personnel who completed military NDI technical school training shall be regarded as having met the formal training requirements for Level 2. Satisfactory proof of this training is a copy of their school house training certificate. A copy shall be placed in the employee's qualification records. Personnel who have completed this schooling will still be required to take a general, specific, and practical examination for each applicable method of requested certification.

4.3. Experience. Candidates for certification at Levels 1, 2, or 3 shall have sufficient practical experience to assure that they are capable of performing the duties of the level for which certification is sought. The minimum requirements for Levels 1 and 2 are given in **Table 2.**, and Level 3 is given in **Table 3** Experience/OJT time shall be documented on AF IMT 797 daily, specifying equipment used, components tested and time accumulated per method. OJT will be under the direction of the direct supervisor and the wage leader trainer. Specialized equipment or technique training (see paragraph. 1.3.) shall also be the responsibility of the direct supervisor and documented in the employee's PAC record.

4.3.1. OO-ALC NDI Method Category Breakdown:

Table 2. Minimum Experience Requirements, Levels 1 and 2

Method	Experience time in hours*		
	Level 1 (Trainee Experience)	Level 2 (Level 1 Experience)	Level 2 Direct Access (no Level 1 Cert.)
Penetrant	130	270	400
MT	130	400	530
IRT	200	600	800
ET	400	1200	1600
UT	400	1200	1600
RT	400	1200	1600
ST	200	600	800
*Experience in multiple methods may be accumulated simultaneously. Experience in method must be at least half this time when remaining time is in other NDI methods, and approved by OO-ALC NDI PM. The OJT hours accrued for each method will not exceed 7 hours for trainees working 8 hour shifts; 8 hours for trainees working 9 hour shifts, and 9 hours for trainees working 10 hour shifts regardless of the NDI method.			

Table 3. Minimum Experience Requirements for Level 3

College or University	Level 2 or Equivalent Experience
None	4 years
2 years of engineering or science study at an accredited technical school, college or university.	2 years
3 to 4 year science or engineering undergraduate degree.	1 year

4.3.2. Previous/Equivalent Experience. Previous or equivalent experience IAW any other NDI qualification/certification programs must be documented to be accepted. The equivalency of the previous experience will be determined by the OO-ALC NDI PM.

4.4. Examinations. The examinations to verify the visual acuity and technical qualifications of candidate personnel shall consist of a vision examination, a general examination, a specific examination and a practical examination. Test questions will be made available only during administration of examinations. Actual test questions given during certification examinations for the most current certification of each method will be kept in each individual's records. The OO-ALC NDI PM shall approve test questions. Test questions will be kept in a locked container or electronically. These questions will only be accessible to 809 MXSS/MXDEA NDI Level 3 personnel.

4.4.1. Visual Acuity. The visual acuity examination shall assure that the applicant's near vision and color perception meet the following requirements. The testing facility must be approved by the OO-ALC NDI PM. The visual acuity test shall be administered annually by the Civilian Dispensary, and recorded on Air Force Materiel Command (AFMC) Form 74, *Nondestructive Inspection Personnel Qualification and Certification Record*. The Civilian Dispensary is medically qualified and authorized by the OO-ALC NDI PM to administer the annual vision tests.

- 4.4.1.1. Near Vision. Jaeger #1 test chart at not less than 12 inches; 20/25 Snellen at 16 inches +/- 1 inch, or approved equivalent as determined by cognizant Level 3. Testing must be completed by medical personnel, with one eye either natural or corrected.
- 4.4.1.2. Color Perception. Distinguish and differentiate between the colors used in the method for which certification is sought; shall be administered prior to certification or re-certification.
- 4.4.2. General Examination. The general examination for all levels shall be a closed book examination consisting of questions that cover the cross-section of the applicable method at the appropriate level. A minimum of 40 questions shall be used for the general examination at each level. For Level 3, the general examination questions will address the general knowledge of other methods, as well as the method for which certification is sought. Possession of a current American Society for Nondestructive Testing (ASNT) Level 3 or equivalent certificate may be satisfactory evidence that the general examination is satisfied. These equivalent ASNT Level 3 certificates may be from a previous employer. Other outside source Level 3 examinations may be used provided the source is approved by the OO-ALC NDI PM. Outside agency exams will be maintained in the applicable NDI Level 3 certification record for audit review.
- 4.4.3. Specific Examination. The specific examination for all levels shall be a closed book examination, except reference material, and shall cover the specifications, codes, equipment, operating procedures and test techniques the candidates may use in the performance of their duties. A minimum of 30 questions shall be used for the specific examination at each level.
- 4.4.4. Written Test. All written tests will be stored in a secure computer-based testing system, or maintained electronically in a secure area until needed. This database will be made available to an auditor if required. No paper copies of tests will be stored anywhere, except in the training records. The tests stored in the training records will have a score on them, along with the individual's name and date that the test was taken. These training records will be kept in a locked container.
- 4.4.5. Practical Examination. The practical examination shall consist of a demonstration of proficiency in performing tasks that are typical of those to be accomplished in the performance of the candidate's duties. Test samples used in the examination may be actual hardware if the candidate is required to demonstrate proficiency in the application of the process, as well as interpretation of results. Images may be used (i.e., such as radiographs), if the candidate is only required to interpret the results, and not perform the process of generating the image. SSQ checklists (Attachment 2) shall be used by SSQ officials during NDI method practical examinations. SSQ checklists and OO-ALC Form 208, *NDI Practical Exam Checklist*, shall be used during each practical exam to assist in the administration and grading of the examination. Additional SSQ checklists will be approved by the OO-ALC NDI PM. All certification and re-certification practical exams will require a written procedure to be completed for each test specimen being evaluated. One test specimen per technique under a method, and a minimum of two specimens will be evaluated for each NDI method during practical exams. These procedures will become part of the certification documentation, and maintained in each individual

training record. As practical test specimens are crack mapped and cataloged, they will be used accordingly. Cracked specimens used for practical exams will be identified on the individual's applicable SSQ checklist within SSQ guidance for audit purposes (see Attachment 2). X-ray film from practical exams will be maintained in the 809 MXSS/MXDEA NDI Program Management Office. All test specimens will be kept secured until needed.

4.4.5.1. Level 1. The candidate shall demonstrate proficiency by using the appropriate method to examine at least one test sample for each technique to be used, and document the results. The test samples shall be representative of the products to be encountered by the candidate in the performance of their duties. The SSQ checklist shall address proficiency in the use of equipment and material, adherence to procedural details, and documentation of results.

4.4.5.2. Level 2. The candidate shall demonstrate proficiency by using the appropriate method to examine at least two test samples for each method. The test samples shall be representative of the product to be encountered by the candidate in the performance of their duties. The candidate shall interpret, evaluate and document the results of the examination of the test samples. The SSQ checklist shall include proficiency in the use of equipment and materials. The candidate shall adhere to procedural details, interpretation, and the evaluation of all relevant indications. The candidate also will be required to demonstrate the ability to develop work instructions.

4.4.5.3. Level 3. The candidate shall demonstrate proficiency by preparing an NDI procedure appropriate to T.O. requirements.

4.4.5.4. Level 3 Production Acceptance. When the candidate's duties will include inspection or evaluation of products, the proficiency in performance of such tasks shall be demonstrated and documented using the applicable SSQ checklist. SSQ checklists shall address the practical and technical adequacy of the procedures prepared by the candidate, and when applicable, the adequacy of interpretation and evaluation of indications. In the event that the candidate has already developed satisfactory procedures, it is not necessary to develop another one for the practical examination. The results of the practical examination shall be documented.

4.4.6. Administration. An 809 MXSS/MXDEA NDI Level 3, who is knowledgeable and familiar with the specifications, standards, codes, techniques and products inspected at OO-ALC, and certified Level 3 in the method for which examinations are given, shall be responsible for the administration of all qualification examinations. The administration and grading of those examinations using multiple choice or true/false type questions can be delegated by the Level 3. Responses to essay questions must be evaluated by the responsible Level 3 to verify the certification candidate's adequate understanding of the subject matter. Only the appropriate 809 MXSS/MXDEA NDI Level 3 can administer practical examinations in the methods for which they are certified. All 809 MXSS/MXDEA Level 3 certifications must be approved by the OO-ALC NDI PM. The OO-ALC NDI PM shall approve any outside agency used to administer all tests. **Note:** Under no circumstance can an examination be administered by one's self, or by a subordinate.

4.4.7. Grading. The candidate for certification must achieve a minimum grade of 70% on the general and specific qualification examinations. The candidate must detect all discontinuities or conditions specified by the Level 3 during the practical examination, and achieve a minimum score of 70%. The candidate must have an average score on all three required tests (general, practical, and specific) of no less than 80%, in order to be eligible for certification. All examination scores shall be of equal weight in determining the average score. Scores for third party examinations where grading is pass/fail, the value of pass used for the average score shall be 80%.

4.4.8. Re-Examination. A candidate failing a portion of any examination shall wait a minimum of 30 days before being re-examined. The 30 days shall be utilized for refresher training (both OJT and self-study). Training shall be under the direction of the first-level supervisor, and shall address those areas found deficient in the candidate's skill or knowledge. During the training period, the supervisor will ensure that the candidate is assigned to work with a certified Level 2 individual, with extensive knowledge in the areas where the candidate has deficiencies. Re-examination shall not utilize the same written exams or test specimens that were used in initial qualification. The additional training shall be documented, and shall address those areas found deficient in the candidate's skills or knowledge. The candidate's supervisor shall be responsible for documenting this training, and all training shall be entered in the individual's PAC folder. A copy of this documentation shall also be provided to the certifying official, prior to re-examination of the candidate. The re-examination shall not utilize the same written tests, or practical specimens that were used in the previous failed examination. The re-examination written tests must contain a minimum of 25% new questions. **Note:** If Level 2 personnel with the required skills to perform OJT are not available, the supervisor may request Level 3 support to perform the additional training. The request for Level 3 support will be made in writing from the second-level supervisor to the OO-ALC NDI PM. The request shall provide justification why there are no certified Level 2 personnel capable to perform this OJT training.

4.4.8.1. Requests for first re-examination: The first-level supervisor will document and certify in writing, a minimum of 40-hours refresher NDI training. Training documentation and a request for re-examination must be submitted to the OO-ALC NDI PM, or designated alternate by the first-level supervisor.

4.4.8.2. Second re-examination: If the candidate fails any portion of first re-examination, the first-level supervisor will document and certify in writing an additional 40-hours refresher NDI training. The training documentation and a request for second re-examination request must be submitted to the OO-ALC NDI PM, or designated alternate with a NDI production flight chief endorsement.

4.4.8.3. Third re-examination: If the candidate fails any portion of a second re-examination, he/she will be required to perform 80-hours of refresher training, and repeat the basic course in the applicable method. Upon successful completion of the basic course, the first-level supervisor will document and certify 80-hours of refresher training and submit a request for third re-examination to the OO-ALC NDI PM, or designated alternate with a science and engineering lab chief endorsement.

4.4.8.4. If the candidate fails any portion of a third re-examination, the certification shall be revoked. **Note:** See paragraph 4.10. for certification reinstatement requirements.

4.5. Instructors. Instructors shall have the skills and knowledge to plan, organize and present classroom, laboratory, or OJT programs of instruction IAW approved course outlines. Instructors shall be certified Level 3, and assigned to the 809 MXSS/MXDEA. If for any reason the 809 MXSS/MXDEA does not have the required expertise, the OO-ALC NDI PM shall approve the instructor for the applicable method.

4.5.1. In addition to the skill and knowledge in the NDI method, instructors must attend the following course:

4.5.1.1. Special Skills Qualification Official Course (Hill AFB Course # 1217).

4.6. Approval of Instructors. Instructors shall be approved by the OO-ALC NDI PM, and must have the following:

4.6.1. Certified to Level 3 in the method for which they will be designated instructors.

4.6.2. Possess the equivalent of a bachelor of science in engineering, physical science or technology, and have adequate knowledge in the method for which they will be designated instructors.

4.6.3. Possess an associate's degree in physical science or technology, and have a minimum of 2 years experience, or equivalent as a Level 2 in the method for which they will be designated instructors.

4.6.4. Possess a minimum of 4 years experience as a Level 2, or equivalent in the method for which they will be designated instructors.

4.7. Qualification and Approval of Auditors. The OO-ALC NDI PM shall approve personnel performing audits, surveys or assessments. Audit personnel shall meet the requirements in NAS 410 Revision 3, paragraph 5.1.6.

4.8. Certification. Personnel who have demonstrated that they meet the requirements herein, shall be certified by the SSQ official in 809 MXSS/MXDEA IAW this instruction. Certification is not required for personnel who are trainees, or those who are designated as instructors or auditors.

4.8.1. Records. All training records will be kept secured until needed. The following records shall be kept by the appropriate organization for as long as an individual's certification is in effect.

4.8.1.1. Name of the individual certified (809 MXSS/MXDEA, certification document);

4.8.1.2. Level, method, and techniques for which individual is certified (809 MXSS/MXDEA, certification document);

4.8.1.3. Results of all qualification examinations including latest written test, and test scores that the individual has taken. Practical exam results will be recorded on SSQ checklist (809 MXSS/MXDEA);

- 4.8.1.4. Date and expiration of current certifications (809 MXSS/MXDEA, certification document);
 - 4.8.1.5. History of all previous NDI certifications (809 MXSS/MXDEA and PAC record);
 - 4.8.1.6. Training history which identifies source, type of training, dates of training, course hours and grades (if given after training), and instructor's name (PAC record and 809 MXSS/MXDEA AF Form 1151, *Training Attendance and Rating*);
 - 4.8.1.7. Experience history with current and previous employers, sufficient to justify satisfaction of experience requirements for certification (809 MXSS/MXDEA and PAC record);
 - 4.8.1.8. Results of physical examinations (AFMC Form 74);
 - 4.8.1.9. Extent and documentation of formal education (809 MXSS/MXDEA personnel folder/PAC folder).
- 4.8.2. The detailed course outlines (for courses listed below) approved by the OO-ALC NDI PM, will be maintained and controlled in the office of the 809 MXSS/MXDEA. In order to save document space, they are not included in this document, but are immediately available upon request.
- 4.8.2.1. MT Inspection Stationary and Portable Level 2 (CTEMAS0000200SU);
 - 4.8.2.2. ET Inspection Level 2 (CTEMAS0000103SU);
 - 4.8.2.3. Fluorescent Penetrant Inspection Stationary and Portable Level 2 (CTEMAS0000100SU);
 - 4.8.2.4. RT Inspection Level 2 (CTEMAS0000401SU);
 - 4.8.2.5. UT Inspection Level 2 (CTEMAS0000301SU);
 - 4.8.2.6. Infrared IRT Level 2 training provided by vendor (Thermal wave Imaging);
 - 4.8.2.7. ST Level 2 training provided by vendor (Laser Technology Incorporated).
- 4.8.3. Qualification Status. Qualification status is provided in writing to the employee's supervisor and the group PAC training monitor. This information is provided to management on a regular basis in order to facilitate scheduling of requalification training, and to provide a list of personnel currently qualified in each NDI method.
- 4.8.4. N-Stamps. Once the candidate has completed all qualification requirements, he or she will be issued an N-stamp. The N-stamp is used to certify completed NDI work, and is the PAC stamp for NDI operations. N-stamps for all NDI personnel are controlled and issued by the 309th Maintenance Support Group (309 MXSG) Business Office PAC Program (309 MXSG/OBA).
- 4.8.5. Program Review. Each year, the 309 MXSG Quality Office will conduct a review to determine OO-ALC compliance with this instruction.
- 4.9. Loss of Certification. Certification may expire, be suspended or revoked. Certification shall expire when employment is terminated, or when the certification interval has lapsed with no re-certification issued. Certification shall not be extended to cover temporary duty or

leave time. Certification shall be suspended when the physical examination is overdue; the individual does not perform in the method certified for at least 3 consecutive months; the individual's performance is found to be deficient in any manner. Certification shall be revoked when the individual does not perform in the method certified for at least 6 consecutive months. Certification shall be revoked if the individuals conduct is found to be unethical or incompetent, and shall not be eligible for reinstatement. Certification shall also be revoked after failure of the 3d re-examination attempt (fourth total attempt), and may only be reinstated by repeating all initial qualification requirements (examination and experience) for that method.

4.10. Reinstatement of Certification. Suspended certifications may be reinstated when the cause for the suspension has been corrected, and the correction was verified by the OO-ALC NDI PM. **Note:** Expired or revoked certifications may not be reinstated except by re-certification.

4.11. Re-certification.

4.11.1. Level 1 and Level 2 Re-certification. Level 1 and Level 2 personnel shall be recertified every 3 years. The year that re-certification is due, visual acuity, general, practical and specific examinations equivalent to those required for initial certification shall be administered. Annual SSQ re-qualification can be satisfied through the annual exam.

4.11.2. Level 3 Re-certification. Level 3 personnel shall be re-certified every 5 years. Re-certification including practical may be accomplished by the Level 3 credit system for re-certification identified in Annex A of NAS 410 Revision 3. If equipment operation or accepting production hardware is required as part of their duties, a practical exam equivalent to initial certification shall be administered. In years which re-certification is not due, only the vision examination will be required; annual SSQ can be satisfied through the annual exam.

4.12. Authorization of Contractors. In the event a contractor is used to augment OO-ALC capability to perform NDI, the contractor shall only be authorized by the OO-ALC NDI PM. The contractor must have a certification program IAW NAS 410 Revision 3. The contractor shall provide the OO-ALC NDI PM a copy of the inspectors' training records, past OJT records, along with current and valid certifications for all NDI methods to be performed in support of OO-ALC. This documentation must show compliance with NAS 410 Revision 3, and provided for each individual performing inspections under this support contract, and will be required to attend any additional training as deemed necessary by the owning organization and the OO-ALC NDI PM. Authorization of contractors stated in this section applies to all entities governed by the OO-ALC, and stated in this instruction. **Note:** Unless otherwise stated in the contract management office contract, all contractors are responsible for the above listed certification process and all funding associated with obtaining these required certifications.

5. Stamp.

5.1. Contractor Stamping Paperwork. Any approved contractor performing inspections at OO-ALC shall provide the OO-ALC NDI PM with stamp number information for each individual authorized to inspect actual hardware. The individual performing the inspection shall use the stamp issued by their employer to stamp paperwork. The contractor shall be aware of the requirements of AFMCI21-101, as it applies to accepting work accomplished.

HERMAN J. RAIFF, GS-15, DAF
Vice Director, Ogden Air Logistics Complex

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 21-101_AFMCSUP, *Aircraft and Equipment Maintenance Management*, 26 April 2012

AFI 21-101_AFMCSUP_309MXWGM21-04, *Aircraft and Equipment Maintenance Management*, 16 March 2012

AFI 20-114, *Air and Space Equipment Structural Management*, 07 June 2011

AFMAN 33-363, *Management of Record*, 1 March 2008

AFMCI 21-101, *Depot Maintenance Activation Planning*, 14 June 2012

NAS 410 Revision 3, *Certification and Qualification of Nondestructive Test Personnel*, March 2008

T.O. 33B-1-1, *Nondestructive Inspection Methods, Basic Theory*, 15 November 2010

T.O. 33B-1-2, *Nondestructive Inspection General Procedures and Process Controls*, 1 April, 2008

Prescribed Forms

OO-ALC Form 208, *NDI Practical Exam Checklist*, Pending Publication

Adopted Forms

AF Form 1151, *Training Attendance and Rating*, 23 March 2003

AFMC Form 74, *Nondestructive Inspection Personnel Qualification and Certification Record*, 1 July 1992

AF IMT 797, *Job Qualification Standard Continuation/Command JQS*, 01 August 2002

AF IMT 847, *Recommendation for Change of Publication*, 22 September 2009

Abbreviations and Acronyms

AF—Air Force

AFB—Air Force Base

AFI—Air Force Instruction

AF IMT—Air Force Information Management Tool

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMCI—Air Force Materiel Command Instruction

AFMCSUP—Air Force Materiel Command Supplement

ASNT—American Society for Nondestructive Testing

ET—Eddy Current

GM—Guidance Memorandum

IAW—In Accordance With

IRT—Thermography

MT—Magnetic Particle

NANDTB—National Aerospace Nondestructive Testing Board

NAS—National Aerospace Standard

NDI—Nondestructive Inspection

NDT—Nondestructive Testing

OJT—On-the-job Training

OO—ALC – Ogden Air Logistics Complex

OPR—Office of Primary Responsibility

PAC—Production Acceptance Certification

PM—Program Manager

PT—Liquid Penetrant

RDS—Records Disposition Schedule

RT—Radiography

SSQ—Special Skills Qualification

ST—Shearography

T.O.— Technical Order

UT—Ultrasonic

309 MXSG—Maintenance Support Group

309 MXSG/OBA—Business Office PAC Program

809 MXSS—Maintenance Support Squadron

809 MXSS/MXDEA—Materiel Engineering Flight/NDI Program Management Office

Terms

Auditor:—An individual who reviews nondestructive testing (NDT) facilities and general procedures for compliance to NDT technical requirements.

Certification: The formal documented authorization for an individual to certify and accept responsibility for the conformance of a specific product, or service—related tasks under the PAC program. This document refers to the latter of these uses. This certification is accomplished by the first-level supervisor or above, with authority over the individual after completion of required training and demonstration of proficiency. Technicians must first be SSQ qualified IAW this instruction, prior to certification for any PAC NDI associated task.

Closed Book Examinations:—An examination administered without access to reference material, except that provided with or in the examination.

Cognizant NDT Organization:—The prime contractor or employer's organization recognized as being responsible for administering qualification and certification of NDT personnel.

Direct Readout Instrument:—Direct readout instruments physically display values either as digital readout, or an analog display, such as a scale/pointer configuration. Direct readout instruments do not involve adjusting signal displays such as gates, delays, gain, or phase to obtain measurements.

Documented:—The condition of being in written or electronic form.

Employer: A government prime contractor, sub—contractor, supplier, processor, or outside agency employing individuals performing NDT.

Evaluation:—A review; following interpretation of the indications noted during an NDT inspection, to determine whether they meet specified acceptance criteria, or to determine its significance.

Examination:—Formal, controlled and documented testing conducted IAW a documented written practice to verify the candidate's knowledge of applicable NDT methods.

Experience:—Actual performance or observation conducted in the work environment resulting in the acquisition of knowledge and skill. This does not include classroom or laboratory training, but does include OJT.

Formal Training: An organized and documented program of activities designed to impart the knowledge and skills necessary to be qualified to this standard. Formal training may be a mix of classroom, practical, and programmed self—instruction as approved by the responsible Level 3, or National Aerospace Nondestructive Testing Board (NANDTB).

General Examination:—A written examination addressing the basic principles and theory of the applicable NDT method.

Indication:—The response or evidence of a condition resulting from an NDT inspection, which requires interpretation to determine its significance.

Instructor:—An individual qualified and designated IAW this standard to provide training for NDT personnel.

Interpretation: The determination of whether indications are relevant or non—relevant.

Method:—One of the disciplines of NDI or testing (e.g. RT) within which different techniques exist.

National Aerospace Nondestructive Testing Board:—An independent national aerospace organization representing a nation's aerospace industry chartered by the participating prime contractors, and recognized by the nation's regulatory agencies; to provide or support NDT qualification and examination services IAW this standard. Such services may include participation in certification.

On—the-Job Training (OJT): Training in the work environment involving: learning instrument set-up, equipment operation, recognition of indications, and interpretation under appropriate technical guidance.

Outside Agency: An independent or national body providing training and examination of NDT personnel, or any other NDT services to the requirements of this standard. Consultants and self—employed individuals are included in this definition.

Practical Examination:—The examination used to demonstrate an individual's ability to conduct the NDT method that will be performed for the employer. Questions and answers do not need to be written, but a SSQ checklist must be used, and observations and results must be documented.

Prime Contractor:—An organization having overall responsibility for design, control and delivery of a system, component, or product.

Procedure:—A general or detailed written instruction for conducting a given process.

Qualification:—The skill, training, knowledge, experience and when applicable, the visual acuity required for personnel to properly perform to a particular level.

Responsible Level 3: The responsible Level 3, as defined by NAS 410 Revision 3, is the OO—ALC NDI PM.

Specific Examination:—The written examination to determine an individual's understanding of operating procedures, codes, standards, product technology, test techniques, equipment, and specifications for a given method as used by the employer.

Sub—Contractor: An organization responsible to the prime contractor for the manufacture or maintenance of aerospace products. For the purposes of this standard, this includes suppliers and processors.

Technique:—A category within a method; for example, UT immersion testing or UT contact testing. Specific techniques within a method are defined by the cognizant NDT organization or NANDTB.

Test Samples:—Parts or images containing known discontinuities or defects used in the practical examination to demonstrate the candidate's proficiency in using a particular method. Test samples can refer to images of actual hardware, such as radiographs.

Written:—Retrieval electronic or hard copy.

Written Instruction:—A procedure detailing the NDT technique, and testing parameters used for the inspection of a specific component, group of parts (e.g., aluminum extrusions or aluminum brackets), or assembly. These are sometimes referred to as technique sheets or data cards.

Written Practice:—A procedure that describes the control and administration of NDT personnel, qualification, and certification.

Attachment 2**SSQ CHECKLISTS****Figure A2.1. SSQ Checklists**

14-0001 Eddy Current Inspection Levels I, II, III (Certification (Cert) Code 401, 402, 403)
14-0002 Fluorescent Penetrant Inspection Levels I, II, III (Cert Code 3298, 3299, 3300, 3301, 3302, 3303)
14-0003 Magnetic Particle Inspection Levels I, II, III (Cert Code 3304, 3305, 3306, 3307, 3308)
14-0004 X-Ray Inspection Levels I, II, III (Cert Code 416, 417, 418)
14-0005 Ultrasonic Inspection Levels I, II, III (Cert Code 420, 421, 422)
14-0006 Shearography Inspection, Levels I, II, III (Cert Code 1700, 1702, 1703)
14-0007 Thermography Inspection, Level I, II, III (Cert Code 1703, 1704, 1705)